

Technical Report on Inventory of Fish Aggregating Devices (FADs)/Payao in Sulu-Sulawesi Seas



Joint Research Program on Tuna Resources in Sulu and Sulawesi Seas

Technical Report

on

**Inventory of
Fish Aggregating Devices (FADs)/*Payao*
in Sulu-Sulawesi Seas**



Southeast Asian Fisheries Development Center

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Abstract

As part of Joint Research Program on Tuna Resources in Sulu-Sulawesi Sea, an inventory of Fish Aggregating Devices (FADs)/*Payaos* along oceanographic survey track was carried out onboard M.V.SEAFDEC2 during October to December 2014 and March to May 2015. This is to determine the extent of FADs distribution and density in this sub-region. Using scanning radar and verification using binoculars/telescopes, a total of 510 FADs/*Payaos* were observed and inventoried along survey tracks in the study area. Majority of FADs/*Payaos* are anchored type and made of steel type buoys. Most dense FADs/*Payaos* observation is located outside Sarangani Bay, North of Manado in Indonesia and at about Latitude 4° N Longitude 122° E with mean density of 12-15 *Payaos*/36 sq.NM.

Keywords: *Payaos*, Fish Aggregating Devices (FADs), Sulu-Sulawesi Seas

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Introduction

The **Joint Research Program on Tuna Resources in Sulu-Sulawesi Sea (SSS)** was conducted in year 2014 and 2015. It was supported by Japanese Government through the Japanese Trust Fund program entitles “Offshore Fisheries Resources Exploration in the Southeast Asian Region”. Further, the research activity is one of the priority commitments of the Philippines to the SEAFDEC Council in this sub-regional. The results of the research program will benefit the tuna fishing sector. As agreed by the three participating countries, one of the focus of this research program was to assess the use of Fish Aggregating Devices (FADs) on tuna fisheries in SSS. Thus, this study covers survey of FADs/*Payaos*. In particular, the Sulu-Sulawesi Sea area will be determined of tuna stock status as well as the survey on the use of FADs/*Payaos* in this Sub-Region. The Capture Fisheries Division in coordination with the National Fisheries Research Development Institute (NFRDI), the National Marine Fisheries Development Center (NMFDC) and Training Department of SEAFDEC facilitated smooth implementation of the research survey and other activities as stated under the Program.

Fish Aggregating Devices (FADs) or locally known as Payao is considered as one of the most effective fishing technology developed that significantly contributed to the increase on Philippines’ marine fishery production (Dickson and Pastoral, 1995). In the year 1988, some big Filipino commercial fishing companies had seek access in some South Pacific countries thereby deploying Payaos in the international waters. Its utilization spread the vast waters in areas of South China Sea, Sulu Sea, Pacific Seaboard, Davao Gulf, Moro Gulf and Celebes Sea. These Waters, particularly the Philippines Waters are important as spawning and nursery grounds from where juveniles start to migrate when they reach about 30 cm fork length (FL) (Aprieto, 1991). Juvenile tunas have found to have associative behavior with the FADs/*Payaos* (Babaran, 2011). Composed of four functional parts, the float, anchor, mooring/anchor line and the attractant or “*Habong*”, its classification is determined by the kind of design and material used in the floating section. It may also be classified as free-floating/drifting or stationary/anchored. Believed to have been gradually developed due to the local experiences/observations of the aggregating tendencies of fishes underneath floating debris, FADs/*Payaos* were utilized from coastal or near shore waters for municipal and sustenance fishing to offshore or deep seas for commercial fisheries. The proliferation on the utilization of FADs/*Payaos* particularly in offshore waters supposed that caused an annual mean growth rate of 70.8% within a ten-year period of 1970 (9,054 metric ton: MT) – 1980 (200,810 MT) and in 1994 it reached to 300,000 MT level (Dickson & Pastoral, 1995; Philippine Fisheries Profile, 1993).

The introduction of FADs/*Payaos* in tuna fishing in early 70s triggered the sudden and rapid tuna fishery development but though still increasing in production until early 80s, it is already unstable due to limited and even lack of management strategies (Dickson and

Natividad, 2000). One of the arising issues on the utilization of the technology is on its contribution on depletion of tuna population because of higher juvenile tuna catches by purse seine in FADs/*Payaos* associated sets compared to other types of set (Anon. 2005 as cited by Babaran. 2005). Thus, this study aims to determine relative concentration extent of distribution of FADs/*Payaos* in the SSS through ocular observation and radar recordings during the collaborative survey using the M.V.SEAFDEC2 under this research program. This is hoped to provide necessary recommendations for a sound management measure on the use of FADs in this sub-region.

This paper attempts to signify the extent of distribution and density (number/per unit area) of FADs/*Payaos* along the Sulu-Sulawesi Seas. This paper limits only on the number of FADs/*Payaos* observed along cruise track/stations as basis in density calculation in terms of number per unit area.

Objective

Study on the use of FADs/*Payaos* in the Sulu-Sulawesi Seas by

- 1) Study of Distribution and relative dense of FADs/*Payaos* in SSS waters.
- 2) Study of Types of FADs/*Payaos* deployed around the Sulu-Sulawesi Seas

Methodology

Material

The study was conducted onboard M.V.SEAFDEC2 (Figure 1). M.V.SEAFDEC2 is a research vessel constructed in Japan and granted to Southeast Asia Countries through of Southeast Asian Fisheries Development Center (SEAFDEC). She is equipped with the modern oceanographic and fishing equipments, capable of undergoing offshore resource assessment surveys. List of inventory material used in FADs/*Payaos* inventory;



- 1) Radar Furuno Model FR-2165 DS
- 2) Binocular Nikon
- 3) Camera Nikon D80 AF-S DX Zoom-Nikkor 18-135 mm f/3.5-5.6G IF-ED
- 4) Lens AF-S VR ED Zoom-Nikkor 70-200mm f/2.8 G(IF) with AF-S Tele-converter 20 EII



Figure 1 Material used in FADs/*Payaos* inventory

(1) Source: <http://www.furounusa.com> (2)-(4) Photo by Sayan Promjinda

Method

Navigators and duty officers on wheelhouse play the most important role to daily monitor the possibility objects on Radar screen. Determining the relative concentration of FADs/Payaos in SSS will be conducted along cruise track using binocular observation (daytime only) and scanning RADAR of M.V.SEAFDEC2 (Model FR-2165 DS) by following step;

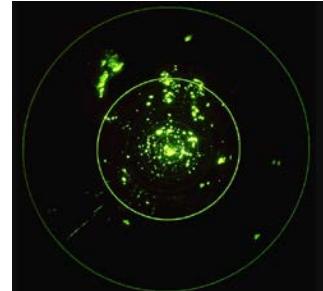
1) The scanning RADAR will be used as the primary tool for the survey and the data recording will be confirm by using binocular.

2) In case of severe weather, the FADs/Payaos observation will be confirmed.

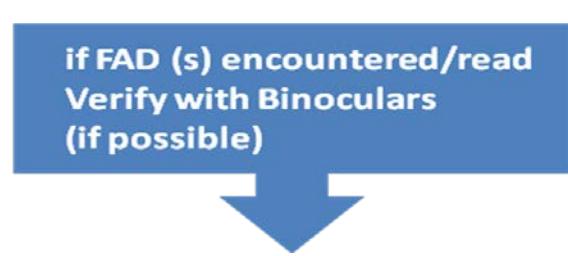
3) Log sheet will be provided to record pertinent will be listed such as vessel's position when the FADs/Payaos was sited, FADs/Payaos relative position to the vessel, its type, associated electronics, etc., and the Inventory of FADs Scanned floating objects were determined whether if boat, FADs/Payaos or others and plotted using Plotting Software e.g. MAXSEA software, Google Earth, etc. (Recommended free software)

4) Type of FADs/Payaos (man-made FADs: Anchored FADs and Drifting FADs) will be recorded.

5) Visual observation by binoculars will be used to confirm the type of FADs/ *Payaos*.



Sources:
<http://www.radartutorial.eu/>



Source: Photo by
Sayan Promjinda



No.	Date	Station	Time	Location		Type of FADs	Remark	page 1
				Lat	Long			
1	28-Mar-15	to St 1	1150	9 49.67	N 118 1.29	E AFADs steel drum	colour: orange	
2	29-Mar-15		0927	10 14.96	N 121 30.22	E AFADs Styrofoam		
3	30-Mar-15	11- 6	0620	8 51.84	N 122 25.44	E AFADs steel drum		
4	30-Mar-15	11- 6	0750	8 56.72	N 122 11.88	E AFADs bamboo		
5	30-Mar-15	11- 6	0924	9 3.52	N 121 56.19	E AFADs steel drum		
6	31-Mar-15	9-10	1105	9 9.01	N 118 50.06	E AFADs steel drum	3 fishing boat	
7	31-Mar-15	9-10	1320	8 48.50	N 118 35.98	E AFADs steel drum	1 fishing boat	
8	31-Mar-15	9-10	1340	8 42.34	N 118 31.26	E AFADs steel drum	3 fishing boat	
9	31-Mar-15	9-10	1347	8 43.50	N 118 37.22	E AFADs steel drum	colour: white	
10	31-Mar-15	10	1625	8 39.63	N 118 28.10	E AFADs steel drum	colour: white	
11	31-Mar-15	10-11	1700	8 40.99	N 118 35.48	E AFADs Styrofoam		
12*	4-Apr-15	21	1247	6 19.14	N 119 30.11	E AFADs steel drum	5 fishing boat /collected sample	
13	4-Apr-15	21-22	1425	6 27.59	N 119 39.88	E AFADs steel drum	colour: white	
14	4-Apr-15	21-22	1444	6 31.45	N 119 42.00	E AFADs steel drum	colour: Red	
15	4-Apr-15	21-22	1500	6 30.00	N 119 45.43	E AFADs steel drum	colour: white	
16	4-Apr-15	21-22	1630	6 37.19	N 119 59.44	E AFADs steel drum	colour: white	
17	4-Apr-15	21-22	1645	6 42.50	N 120 2.72	E AFADs steel drum	colour: white	
18	4-Apr-15	22	1710	6 45.49	N 120 5.62	E AFADs steel drum	colour: white	
19	8-Apr-15	to St 24	0915	6 49.35	N 122 18.82	E AFADs bamboo		
20	8-Apr-15	24	1050	6 50.06	N 121 28.24	E AFADs bamboo		
21	8-Apr-15	24	1053	6 50.04	N 121 29.13	E AFADs bamboo		
22	8-Apr-15	24	1058	6 50.04	N 122 29.59	E AFADs bamboo		
23	8-Apr-15	24	1058	6 50.04	N 122 29.93	E AFADs bamboo		
24	8-Apr-15	24-25	1257	6 52.95	N 122 31.49	E AFADs bamboo		
25	8-Apr-15	24-25	1317	6 52.02	N 122 34.49	E AFADs bamboo		
26	8-Apr-15	24-25	1329	6 50.01	N 122 34.689	E AFADs bamboo		
27	8-Apr-15	24-25	1341	6 49.55	N 122 37.73	E AFADs steel drum		
28	8-Apr-15	24-25	1345	6 42.04	N 122 37.14	E AFADs steel drum		
29	8-Apr-15	24-25	1430	6 46.00	N 122 43.0	E AFADs steel drum		
30	8-Apr-15	24-25	1440	6 46.00	N 122 45.0	E AFADs steel drum		
31	8-Apr-15	24-25	1450	6 51.00	N 122 38.0	E AFADs steel drum	colour: white	
32	9-Apr-15	27-28	0550	6 15.34	N 123 45.51	E AFADs steel drum	colour: white	

Figure 2 Process of FADs/Payaos survey

Area of the inventory

The inventory covered the areas along the oceanographic track/station of Cruise of M.V.SEAFDEC2 from a period of 25 October to 1 December 2014 and 28 March to 1 May 2015. During Cruise, the Sulu Sea area which was covered by M.V.SEAFDEC2 is bounded within the coordinates: from Latitude 6.25° N to 10.5° N and Longitude 117.75° E to 122.75° E while Celebes Sea area in bounded by Latitude 1° 05' N to 7° 00' N and Longitude 119.5° E to 125.5° E (Figure 3).



Figure 3 (Up) Location of Sulu and Sulawesi Sea, (Down) Oceanographic Stations and Navigation route of M.V.SEAFDEC2 surveyed in Sulu and Sulawesi Sea

Data Acquisition and Processing

Inventory of FADs was conducted from one station to another along cruise track using scanning radar (Furuno Model FR-2165 DS). The radar is capable of tracking/scanning at varied radius. Cruise Plan was carefully designed to suit that scanning is only during broad daytime to assure verification using binoculars onboard. A log sheet was provided wherein scanned FADs/Payaos were listed. Other pertinent data such as vessel's position when the FADs/Payaos was sited, FADs/Payaos relative position to the vessel, its type and date it was sited were also noted. Scanned floating objects were determined whether if boat, FADs/Payaos or others and plotted using MAXSEA Plotting Software. Duplication of sighted FADs/Payaos during both cruise periods was checked using Google Earth® software (google.com). Plotted FADs/Payaos

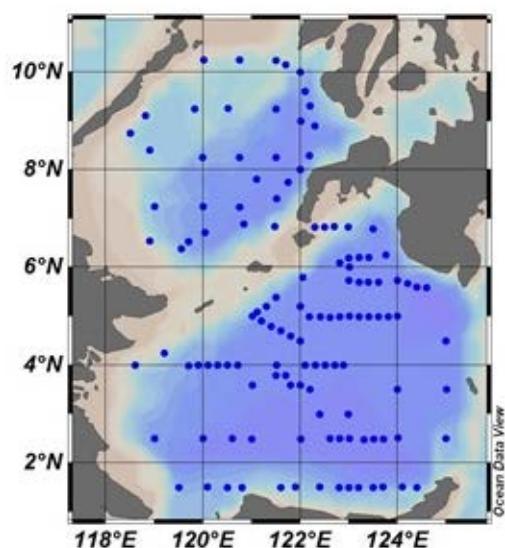


Figure 4 Plotted reference points/center positions of 36 sq. NM Grid.

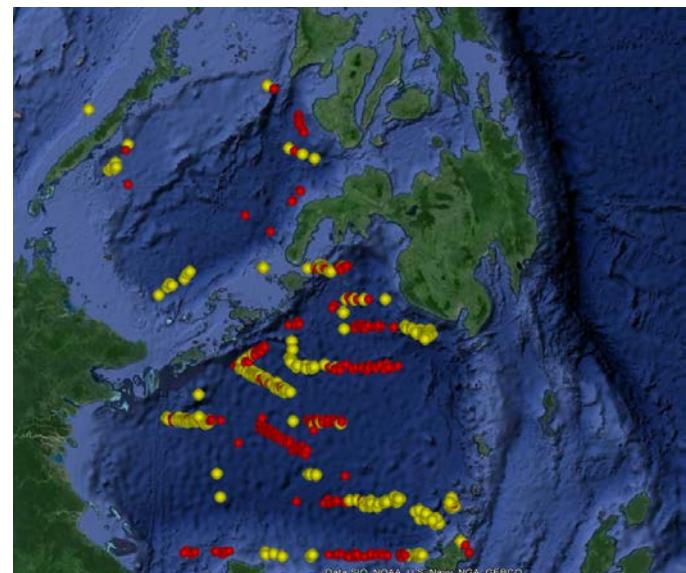
within one nautical mile radius was corrected for duplication.

Accumulated FADs/*Payaos* positions sighted and scanned were plotted using SURFER32 plotting software and Ocean Data View (ODV) Software. ODV plot of FADs/*Payaos* was zoomed up to 36 square nautical miles (NM) (0.1 degree = 6 NM each side) along the Cruise track. The center of each 36 square NM grid was determined of position and number of Payao within it was noted (Figure 4).

Results and Discussion

After two sampling cruises, a total of 510 FADs/*Payaos* were observed and inventoried along the oceanographic track of M.V.SEADEC2. The first cruise was 287 FADs/*Payaos*. The second cruise was 223 FADs/*Payaos*. See Appendix 1 for total list of FADs observed by M.V.SEADEC2.

Figure 5 Plotted FADs/*Payaos*. Red dots - 2014 inventory, Yellow dots – 2015 inventory



All observed FADs/*Payaos* are anchored type which is common in this region. In terms of types, majority or about 87% are of Steel-type buoys followed by Bamboo raft FADs/*Payaos* (6.5%) and some Styrofoam floaters (3%).



Steel-type buoys

Bamboo raft

Styrofoam floaters

Figure 6 Three (3) major types of FADs/*Payaos* found around Sulu and Sulawesi Sea

As observed, FADs/*Payaos* concentration is most at the outer Sarangani Bay, North of Manado in Indonesia and at about Latitude 4° N Longitude 122° E. Average concentration values in these areas was observed from 12-15 FADs/*Payaos* per 36 square NM. In comparison, the Celebes Sea area has denser concentration of FADs/*Payaos* than Sulu Sea. Observed highest concentration in Sulu Sea area is just 3 FADs/*Payaos* per 36 square NM of area while highest value in Celebes sea was at 17 FADs/*Payaos* per 36 Square NM. See Figure 7 for color-scaled concentration map using Ocean Data View (ODV) of FADs/*Payaos* observed during Cruise. Further, calculated mean density throughout the Celebes Sea area is at 4.50 FADs/*Payaos* /36 sq. NM while only 1.1 FADs/*Payaos* per 36 sq. NM in Sulu Sea.

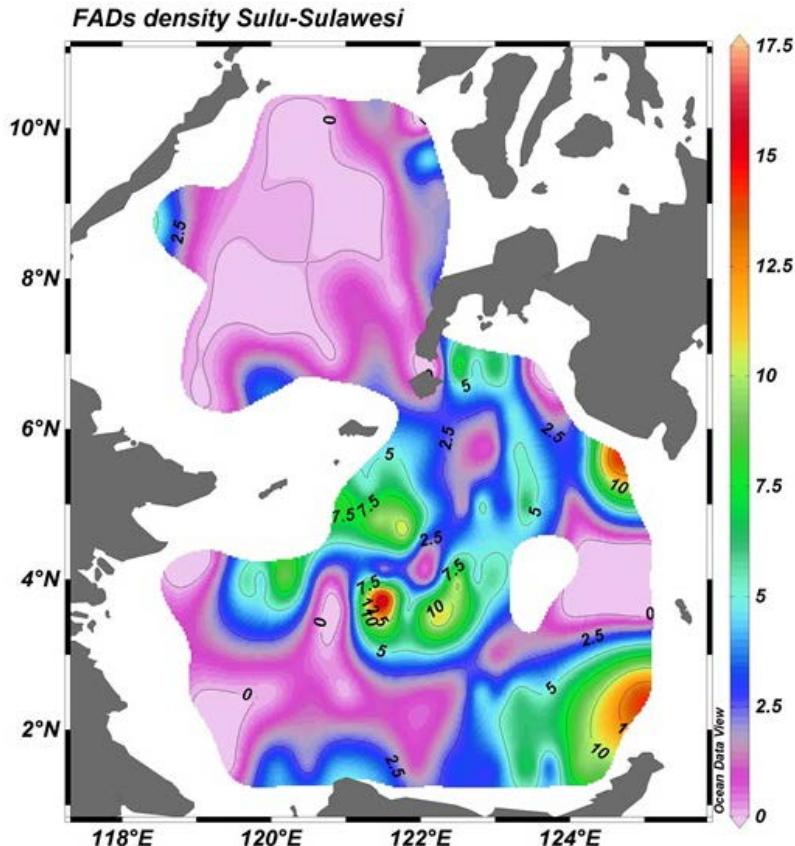


Figure 7 Color-scaled concentration map of FADs/*Payaos* around SSS

Most dense area situated just outside of Sarangani Bay, North of Manado in Indonesia and at about Latitude 4° N Longitude 122° E is possibly due to proximity to ports and other landing areas. Economically and efficiency wise, factors such as location of immediate/nearest fishing area is very vital in fishing proficiency. Dense FADs/*Payaos* concentration is also for the purpose of easy monitoring from poachers and other deliberate destruction. These are some of the conflicts confronting unguarded offshore FADs/*Payaos*. Conflicts also arise on the accidental destruction caused by other fishing methods such as drift gillnets and tuna longlines (Dickson & Pastoral, 1995). In addition, tuna seining fleets in the country deploys FADs/*Payaos* watcher boats to easily monitor their respective FADs/*Payaos* clusters/chain. FADs/*Payaos* density may also suggest good site for fishing thus competition on the right to occupy such areas also arises (Dickson & Pastoral, 1995).

Tagging data results indicated that exploitation of tuna with FADs/*Payaos* is very high in Philippine waters (Primex, 1993 as cited by Dickson & Pastoral, 1995). Further, based on the South Pacific Commission study in Solomon Waters, the probability of skipjack exiting a particular half degree (30 NM) square can be reduced by about half with the presence of about five (5) FADs/*Payaos*. Importance of data on the purpose of deployed FADs/*Payaos* in the study area is also vital to assess different impact by various fishing methods. In catch data presented by Babaran (2006) among three (3) fishing gears (purse seine, ring net and handline) unloading tuna catch in General Santos City Fish Port Complex, indicates that the size range of tuna species captured by ring nets and purse seines is wide and suggests that these two gears are capturing small sized tuna.

Conclusion

Distribution of FADs/*Payaos* is very much apparent along Celebes Sea area. Most dense Payao observation is located outside Sarangani Bay, North of Manado in Indonesia and at about Latitude 4° N Longitude 122° E is possibly due to proximity to ports and other landing areas with value of 12-15 FADs/*Payaos* per 36 sq NM. Mean Payao density in the entire Celebes Sea area is 4.5 FADs/*Payaos* per 36 sq. N.M. while only about 1.1 in Sulu Sea Area. Majority or about 87% are of Steel-type buoys followed by Bamboo raft FADs/*Payaos* (6.5%) and some Styrofoam floaters (3%) It is supposed that dense distribution along outer Saranggani Bay and near shore areas is due to the proximity of fish landing site and for the purpose of monitoring.

Acknowledgement

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Appendices

Appendix 1 Log Sheet Inventory of FADs in Sulu and Sulawesi Seas

Appendix 2 FADs/Payaos inventory in Sulu and Sulawesi Seas the second cruise survey in 22 October to 28 November 2014

No.	Date	Station	Time	Location						Type of FADs	Remark	
				Lat			Long					
1	26-Oct-14	3	0740	#	15	20	N	121	29	30	E	AFADs/Foam
2	26-Oct-14	3	1036	#	10	96	N	121	38	11	E	AFADs/Plastic drur
3	26-Oct-14	3	1034	9	10	96	N	121	38	11	E	AFADs/Plastic drur
4	26-Oct-14	4-5	1644	9	40	97	N	122	06	28	E	AFADs/Foam
5	26-Oct-14	4-5	1652	9	38	20	N	122	06	70	E	AFADs/Foam
6	26-Oct-14	4-5	1700	9	37	40	N	122	07	70	E	AFADs steel drum
7	26-Oct-14	4-5	1709	9	35	50	N	122	06	90	E	AFADs/Foam
8	26-Oct-14	4-5	1712	9	33	79	N	122	05	90	E	AFADs/Foam
9	26-Oct-14	4-5	1718	9	32	04	N	122	08	36	E	AFADs/unidentified
10	26-Oct-14	4-5	1730	9	29	00	N	122	07	90	E	AFADs/unidentified
11	26-Oct-14	4-5	1810	9	25	10	N	122	11	60	E	AFADs/unidentified
12	26-Oct-14	4-5	1835	9	21	03	N	122	12	99	E	AFADs/unidentified
13	27-Oct-14	II-6	0635	9	00	43	N	122	02	63	E	AFADs steel drum
14	28-Oct-14	9-10	0834	9	02	16	N	118	47	92	E	AFADs steel drum
15	28-Oct-14	10-11	1548	8	23	20	N	118	51	70	E	AFADs steel drum
16	29-Oct-14	I2	0611	8	16	27	N	122	09	17	E	AFADs steel drum
17	29-Oct-14	I2	1616	8	14	90	N	122	09	95	E	AFADs /bamboo
18	29-Oct-14	I2-15	0930	8	04	97	N	122	01	52	E	AFADs /bamboo
19	29-Oct-14	I2-15	0940	8	03	57	N	122	00	36	E	AFADs /bamboo
20	29-Oct-14	I2-15	1125	7	48	36	N	121	88	00	E	AFADs /bamboo
21	29-Oct-14	15-16	1507	7	30	30	N	121	36	50	E	AFADs steel drum
Leg 2												
22	5-Nov-14	24	1017	6	49	58	N	122	26	99	E	AFADs /bamboo
23	5-Nov-14	24	1020	6	49	95	N	122	28	59	E	AFADs /bamboo
24	5-Nov-14	24	1022	6	48	42	N	122	29	28	E	AFADs /bamboo
25	5-Nov-14	24	1025	6	50	28	N	122	30	53	E	AFADs /bamboo
26	5-Nov-14	24-25	1310	6	50	62	N	122	33	74	E	AFADs steel drum
27	5-Nov-14	24-25	1330	6	49	28	N	122	37	90	E	AFADs steel drum
28	5-Nov-14	24-25	1330	6	51	84	N	122	37	30	E	AFADs steel drum
29	5-Nov-14	24-25	1500	6	50	93	N	122	53	14	E	AFADs steel drum
30	5-Nov-14	24-25	1510	6	47	48	N	122	55	67	E	AFADs steel drum
31	5-Nov-14	24-25	1515	6	48	87	N	122	57	21	E	AFADs steel drum
32	5-Nov-14	24-25	1535	6	51	11	N	122	58	02	E	AFADs steel drum
33	5-Nov-14	24-25	1540	6	51	38	N	123	01	62	E	AFADs steel drum
34	5-Nov-14	24-25	1750	6	51	29	N	123	01	86	E	AFADs steel drum
35	5-Nov-14	24-25	1755	6	52	38	N	123	03	33	E	AFADs steel drum
36	6-Nov-14	27-28	0600	6	14	98	N	123	26	73	E	AFADs steel drum
37	6-Nov-14	27-28	0640	6	14	99	N	123	19	31	E	AFADs steel drum
38	6-Nov-14	27-28	0705	6	14	98	N	123	14	74	E	AFADs steel drum
39	6-Nov-14	27-28	0705	6	14	98	N	123	14	74	E	AFADs steel drum
40	6-Nov-14	27-28	0725	6	17	79	N	123	09	21	E	AFADs steel drum
41	6-Nov-14	27-28	0727	6	14	93	N	123	10	15	E	AFADs steel drum
42	6-Nov-14	27-28	0738	6	17	00	N	123	04	70	E	AFADs steel drum
43	6-Nov-14	27-28	0739	6	13	42	N	123	06	77	E	AFADs steel drum
44	6-Nov-14	27-28	1135	6	08	82	N	122	48	45	E	AFADs steel drum
45	6-Nov-14	27-28	1150	6	05	63	N	122	46	75	E	AFADs steel drum
46	6-Nov-14	27-28	1525	5	47	74	N	122	10	04	E	AFADs steel drum
47	6-Nov-14	27-28	1530	5	50	58	N	122	07	56	E	AFADs steel drum

No.	Date	Station	Time	Location								Type of FADs	Remark
				Lat				Long					
48	6-Nov-14	27-28	1550	5	46	82	N	122	05	50	E	AFADs steel drum	
49	6-Nov-14	27-28	1625	5	46	29	N	121	57	93	E	AFADs steel drum	with fishing boat
50	7-Nov-14	30-31	1200	5	45	83	N	123	11	29	E	AFADs steel drum	distance 1.7 nm/ 130°
51	7-Nov-14	30-31	1200	5	42	70	N	123	11	93	E	AFADs steel drum	distance 2.9 nm/ 160°
52	7-Nov-14	30-31	1220	5	46	47	N	123	16	37	E	AFADs steel drum	distance 2.9 nm/ 040°
53	7-Nov-14	30-31	1242	5	47	47	N	123	17	97	E	AFADs steel drum	distance 2.5 nm/ 010°
54	7-Nov-14	30-31	1250	5	46	26	N	123	20	68	E	AFADs steel drum	distance 1.9 nm/ 050°
55	7-Nov-14	30-31	1250	5	43	45	N	123	22	02	E	AFADs steel drum	distance 2.9 nm/ 125°
56	7-Nov-14	30-31	1310	5	42	72	N	123	23	60	E	AFADs steel drum	distance 2.3 nm/ 185°
57	7-Nov-14	30-31	1330	5	45	95	N	123	27	12	E	AFADs steel drum	distance 1.1 nm/ 010°
58	7-Nov-14	30-31	1418	5	44	80	N	123	32	99	E	AFADs steel drum	distance 1.3 nm/ 100°
59	7-Nov-14	30-31	1427	5	44	35	N	123	36	25	E	AFADs steel drum	distance 1.4 nm/ 130°
60	7-Nov-14	30-31	1440	5	46	08	N	123	37	74	E	AFADs steel drum	distance 1.3 nm/ 010°
61	7-Nov-14	30-31	1455	5	45	70	N	123	40	83	E	AFADs steel drum	distance 1.2 nm/ 030°
62	7-Nov-14	30-31	1520	5	45	76	N	123	15	18	E	AFADs steel drum	
63	7-Nov-14	30-31	1556	5	45	19	N	123	23	55	E	AFADs steel drum	
64	7-Nov-14	30-31	1607	5	44	62	N	123	54	31	E	AFADs steel drum	
65	7-Nov-14	30-31	1612	5	44	76	N	123	54	66	E	AFADs steel drum	
66	7-Nov-14	30-31	1630	5	44	54	N	123	54	87	E	AFADs steel drum	
67*	8-Nov-14	33	0607	5	01	56	N	123	59	47	E	AFADs steel drum	collect the sample *
68	8-Nov-14	33-34	0839	4	59	17	N	123	52	91	E	AFADs steel drum	
69	8-Nov-14	33-34	0925	5	00	02	N	123	49	42	E	AFADs steel drum	
70	8-Nov-14	33-34	0935	5	03	99	N	123	47	11	E	AFADs steel drum	
71	8-Nov-14	33-34	0956	4	57	77	N	123	44	83	E	AFADs steel drum	
72	8-Nov-14	33-34	0948	5	02	59	N	123	40	42	E	AFADs steel drum	
73	8-Nov-14	33-34	1005	5	01	76	N	123	39	62	E	AFADs steel drum	
74	8-Nov-14	33-34	1020	4	58	82	N	123	35	10	E	AFADs steel drum	
75	8-Nov-14	33-34	1046	5	00	36	N	123	32	73	E	AFADs steel drum	
76	8-Nov-14	33-34	1103	5	02	14	N	123	27	82	E	AFADs steel drum	
77	8-Nov-14	33-34	1110	4	58	81	N	123	27	42	E	AFADs steel drum	
78	8-Nov-14	33-34	1115	4	58	64	N	123	24	76	E	AFADs steel drum	
79	8-Nov-14	33-34	1118	4	56	96	N	123	25	88	E	AFADs steel drum	
80	8-Nov-14	33-34	1118	4	56	30	N	123	24	13	E	AFADs steel drum	
81	8-Nov-14	33-34	1148	4	59	23	N	123	19	89	E	AFADs steel drum	
82	8-Nov-14	33-34	1153	5	00	62	N	123	18	89	E	AFADs steel drum	
83	8-Nov-14	33-34	1225	4	59	76	N	123	13	28	E	AFADs steel drum	distance 0.8 nm/ 255°
84	8-Nov-14	33-34	1231	4	57	83	N	123	10	90	E	AFADs steel drum	distance 2.8 nm/ 221°
85	8-Nov-14	33-34	1247	4	58	20	N	123	08	59	E	AFADs steel drum	distance 1.9 nm/ 205°
86*	8-Nov-14	33-34	1630	5	03	09	N	123	02	11	E	AFADs steel drum	collect the sample *
87	8-Nov-14	34-35	1655	4	58	54	N	122	50	11	E	AFADs steel drum	
88	8-Nov-14	34-35	1700	4	56	78	N	122	55	45	E	AFADs steel drum	
89	8-Nov-14	34-35	1725	5	00	84	N	122	55	15	E	AFADs steel drum	
90	8-Nov-14	34-35	1725	4	58	27	N	122	47	02	E	AFADs steel drum	
91	8-Nov-14	34-35	1725	4	57	13	N	122	49	81	E	AFADs steel drum	
92	8-Nov-14	34-35	1730	4	58	74	N	122	47	62	E	AFADs steel drum	
93	8-Nov-14	34-35	1810	4	59	98	N	122	43	20	E	AFADs steel drum	
94	9-Nov-14	36-37	0530	5	22	17	N	121	31	22	E	AFADs steel drum	
95	9-Nov-14	36-37	0545	5	22	50	N	121	28	96	E	AFADs steel drum	
96	9-Nov-14	36-37	0552	5	19	17	N	121	27	54	E	AFADs steel drum	

No.	Date	Station	Time	Location							Type of FADs	Remark	
				Lat			Long						
97	9-Nov-14	36-37	0604	5	18	94	N	121	24	70	E	AFADs steel drum	
98	9-Nov-14	36-37	0605	5	16	65	N	121	26	58	E	AFADs steel drum	
99	9-Nov-14	36-37	0605	5	19	50	N	121	24	29	E	AFADs steel drum	
100	9-Nov-14	36-37	0633	5	16	03	N	121	20	46	E	AFADs steel drum	
101	9-Nov-14	36-37	0640	5	12	69	N	121	20	28	E	AFADs steel drum	
102	9-Nov-14	36-37	0649	5	12	73	N	121	20	30	E	AFADs steel drum	
103	9-Nov-14	36-37	0651	5	13	38	N	121	16	41	E	AFADs steel drum	
104	9-Nov-14	36-37	0701	5	11	07	N	121	16	74	E	AFADs steel drum	
105	9-Nov-14	36-37	0715	5	04	42	N	121	13	39	E	AFADs steel drum	
106	9-Nov-14	36-37	0747	5	05	78	N	121	10	08	E	AFADs steel drum	
107	9-Nov-14	36-37	0753	5	03	71	N	121	09	60	E	AFADs steel drum	
108	9-Nov-14	36-37	0821	5	01	69	N	121	04	01	E	AFADs steel drum	with fishing boat
109	9-Nov-14	36-37	0827	5	03	41	N	121	02	04	E	AFADs steel drum	
110	9-Nov-14	36-37	0840	5	02	38	N	121	00	00	E	AFADs steel drum	
111	9-Nov-14	36-37	0844	4	59	53	N	121	00	21	E	AFADs steel drum	
112	9-Nov-14	36-37	0846	5	00	77	N	121	57	53	E	AFADs steel drum	
113	9-Nov-14	37-38	1228	4	54	58	N	121	09	94	E	AFADs steel drum	distance 1.6 nm/ 135°
114	9-Nov-14	37-38	1309	4	50	83	N	121	14	35	E	AFADs steel drum	distance 2.0 nm/ 196°
115	9-Nov-14	37-38	1320	4	51	54	N	121	17	14	E	AFADs steel drum	distance 0.6 nm/ 132°
116	9-Nov-14	37-38	1328	4	48	95	N	121	18	04	E	AFADs steel drum	distance 2.4 nm/ 180°
117	9-Nov-14	37-38	1345	4	49	60	N	121	22	43	E	AFADs steel drum	distance 1.8 nm/ 107°
118	9-Nov-14	37-38	1346	4	49	16	N	121	23	45	E	AFADs steel drum	distance 2.2 nm/ 106°
119	9-Nov-14	37-38	1416	4	45	72	N	121	25	38	E	AFADs steel drum	distance 2.1 nm/ 180°
120	9-Nov-14	37-38	1421	4	46	89	N	121	27	22	E	AFADs steel drum	distance 1.3 nm/ 118°
121	9-Nov-14	37-38	1442	4	43	52	N	121	30	78	E	AFADs steel drum	distance 2.8 nm/ 148°
122	9-Nov-14	37-38	1447	4	46	80	N	121	30	44	E	AFADs steel drum	distance 1.2 nm/ 180°
123	9-Nov-14	37-38	1448	4	45	66	N	121	30	97	E	AFADs steel drum	distance 0.7 nm/ 076°
124	9-Nov-14	37-38	1449	4	44	67	N	121	31	94	E	AFADs steel drum	distance 1.7 nm/ 119°
125	9-Nov-14	37-38	1530	4	41	51	N	121	36	15	E	AFADs steel drum	
126	9-Nov-14	37-38	1540	4	42	58	N	121	39	99	E	AFADs steel drum	
127	9-Nov-14	37-38	1620	4	38	59	N	121	42	97	E	AFADs steel drum	with fishing boat
128	9-Nov-14	37-38	1643	4	37	57	N	121	46	88	E	AFADs steel drum	
129	9-Nov-14	37-38	1643	4	35	60	N	121	47	64	E	AFADs steel drum	with fishing boat
130	9-Nov-14	37-38	1655	4	36	84	N	121	49	29	E	AFADs steel drum	colour: white / red
131	9-Nov-14	37-38	1655	4	35	02	N	121	50	14	E	AFADs steel drum	colour: Orange / white
132	9-Nov-14	37-38	1710	4	35	02	N	121	52	04	E	AFADs steel drum	colour: Orange / white
133	9-Nov-14	37-38	1736	4	31	80	N	121	53	67	E	AFADs steel drum	colour: Orange / white
134	10-Nov-14	38-39	1313	3	59	51	N	122	57	35	E	AFADs steel drum	colour: Orange / white
135	10-Nov-14	38-39	1314	4	00	35	N	122	57	40	E	AFADs steel drum	colour: Orange / white
136	10-Nov-14	38-39	1315	3	59	00	N	122	56	61	E	AFADs steel drum	colour: Orange / white
137	10-Nov-14	38-39	1337	4	00	83	N	122	53	85	E	AFADs steel drum	colour: Orange / white
138	10-Nov-14	38-39	1339	3	58	91	N	122	50	30	E	AFADs steel drum	colour: Orange / white
139	10-Nov-14	38-39	1351	4	01	19	N	122	47	94	E	AFADs steel drum	colour: Orange / white
140	10-Nov-14	38-39	1408	4	02	20	N	122	45	21	E	AFADs steel drum	colour: Orange / white
141	10-Nov-14	38-39	1423	4	01	47	N	122	42	75	E	AFADs steel drum	colour: Orange / white
142	10-Nov-14	38-39	1434	3	58	21	N	122	41	41	E	AFADs steel drum	colour: Orange / white
143	10-Nov-14	38-39	1454	4	01	46	N	122	35	75	E	AFADs steel drum	colour: yellow / green
144	10-Nov-14	38-39	1456	3	58	59	N	122	36	20	E	AFADs steel drum	colour: Orange / white
145	10-Nov-14	38-39	1513	3	59	54	N	122	33	89	E	AFADs steel drum	colour: Orange / white

No.	Date	Station	Time	Location							Type of FADs	Remark	
				Lat			Long						
146	10-Nov-14	38-39	1513	4	01	34	N	122	35	71	E	AFADs steel drum	
147	10-Nov-14	38-39	1523	4	01	43	N	122	30	78	E	AFADs steel drum	
148	10-Nov-14	38-39	1525	4	02	95	N	122	29	20	E	AFADs steel drum	
149	10-Nov-14	38-39	1535	4	00	59	N	122	30	14	E	AFADs steel drum	colour: Orange
150	10-Nov-14	38-39	1540	3	58	88	N	122	28	59	E	AFADs steel drum	colour: Orange
151	10-Nov-14	38-39	1540	3	58	67	N	122	27	62	E	AFADs steel drum	
152	10-Nov-14	38-39	1552	4	00	45	N	122	27	15	E	AFADs steel drum	colour: Orange
153	10-Nov-14	38-39	1557	3	50	04	N	122	26	03	E	AFADs steel drum	colour: Green
154	10-Nov-14	38-39	1605	3	59	15	N	122	23	54	E	AFADs steel drum	
155	10-Nov-14	38-39	1605	3	59	22	N	122	23	06	E	AFADs steel drum	colour: Green
156	10-Nov-14	38-39	1610	3	58	03	N	122	21	50	E	AFADs steel drum	
157	10-Nov-14	38-39	1620	4	00	04	N	122	20	70	E	AFADs steel drum	colour: Green
158	10-Nov-14	38-39	1622	4	01	38	N	122	18	81	E	AFADs steel drum	colour: Green
159	11-Nov-14	40-41	0520	3	59	69	N	120	41	60	E	AFADs steel drum	colour: Orange / yellow
160	11-Nov-14	40-41	0613	4	00	16	N	120	31	06	E	AFADs steel drum	colour: Orange / yellow
161	11-Nov-14	40-41	0615	4	00	90	N	120	31	01	E	AFADs steel drum	colour: Orange / yellow
162	11-Nov-14	40-41	0615	3	59	06	N	120	29	56	E	AFADs steel drum	colour: Orange / yellow
163*	11-Nov-14	41	0625	4	02	87	N	121	28	05	E	AFADs steel drum	collect the sample *
164	11-Nov-14	41-42	1110	3	58	31	N	120	23	75	E	AFADs steel drum	colour: Orange
165	11-Nov-14	41-42	1130	3	59	94	N	120	19	45	E	AFADs steel drum	colour: Orange / Red
166	11-Nov-14	41-42	1140	3	59	78	N	120	17	41	E	AFADs steel drum	colour: Orange / Red
167	11-Nov-14	41-42	1236	3	59	47	N	120	08	39	E	AFADs steel drum	colour: Yellow /Green
168	11-Nov-14	41-42	1245	3	59	03	N	120	05	09	E	AFADs steel drum	colour: Yellow /Green
169	11-Nov-14	41-42	1248	3	01	24	N	120	05	24	E	AFADs steel drum	colour: Yellow /Green
170	11-Nov-14	41-42	1310	3	59	53	N	120	01	13	E	AFADs steel drum	colour: Yellow /Green
171	11-Nov-14	41-42	1330	3	59	11	N	119	57	95	E	AFADs steel drum	colour: Yellow /Green
172	11-Nov-14	41-42	1410	3	59	04	N	119	50	05	E	AFADs steel drum	colour: Orange
173	11-Nov-14	41-42	1426	3	37	49	N	119	47	13	E	AFADs steel drum	colour: Orange
174	11-Nov-14	41-42	1427	3	01	12	N	119	46	10	E	AFADs steel drum	colour: Orange
175	11-Nov-14	41-42	1431	3	59	12	N	119	46	72	E	AFADs steel drum	colour: Orange
Leave Sandakan for Bitung													
176	18-Nov-14		0545	3	55	22	N	121	25	62	E	AFADs steel drum	distance 0.3 nm/ 200° / Yellow
177	18-Nov-14		0546	3	55	05	N	121	25	80	E	AFADs steel drum	distance 0.3 nm/ 080° / Yellow
178	18-Nov-14		0550	3	50	68	N	121	26	61	E	AFADs steel drum	distance 1.5 nm/ 180° / Yellow
179	18-Nov-14		0551	3	50	61	N	121	26	74	E	AFADs steel drum	distance 1.5 nm/ 175° / Yellow
180	18-Nov-14		0552	3	50	39	N	121	27	10	E	AFADs steel drum	distance 1.5 nm/ 090° / Yellow
181	18-Nov-14		0555	3	50	16	N	121	27	68	E	AFADs steel drum	distance 1.5 nm/ 010° / Yellow
182	18-Nov-14		0559	3	49	94	N	121	28	05	E	AFADs steel drum	distance 2.0 nm/ 160° / Yellow
183	18-Nov-14		0609	3	53	09	N	121	25	35	E	AFADs steel drum	distance 2.0 nm/ 130° / Yellow
184	18-Nov-14		0622	3	53	27	N	121	29	17	E	AFADs steel drum	
185	18-Nov-14		0624	3	49	62	N	121	28	71	E	AFADs steel drum	
186	18-Nov-14		0635	3	50	86	N	121	32	66	E	AFADs steel drum	
187	18-Nov-14		0636	3	49	93	N	121	31	38	E	AFADs steel drum	
188	18-Nov-14		0641	3	51	47	N	121	31	28	E	AFADs steel drum	colour: white
189	18-Nov-14		0642	3	51	98	N	121	32	26	E	AFADs steel drum	Purse seine fishing boat
190	18-Nov-14		0643	3	49	69	N	121	31	39	E	AFADs steel drum	colour: Orange / white
191	18-Nov-14		0650	3	47	30	N	121	32	59	E	AFADs steel drum	Purse seine fishing boat
192	18-Nov-14		0656	3	50	10	N	121	33	81	E	AFADs steel drum	colour: white / green
193	18-Nov-14		0659	3	50	71	N	121	36	99	E	AFADs steel drum	Purse seine fishing boat

No.	Date	Station	Time	Location						Type of FADs	Remark
				Lat			Long				
194	18-Nov-14		0700	3 49	10	N	121 34	62	E	AFADs steel drum	colour: Red / white
195	18-Nov-14		0707	3 47	60	N	121 35	72	E	AFADs steel drum	colour: Red / white No.38
196	18-Nov-14		0715	3 45	67	N	121 35	97	E	AFADs steel drum	
197	18-Nov-14		0720	3 48	48	N	121 38	32	E	AFADs steel drum	Purse seine fishing boat
198	18-Nov-14		0728	3 46	45	N	121 38	23	E	AFADs steel drum	colour: Red / white
199	18-Nov-14		0740	3 43	93	N	121 42	11	E	AFADs steel drum	Purse seine fishing boat
200	18-Nov-14		0740	3 44	27	N	121 40	30	E	AFADs steel drum	colour: Red / white
201	18-Nov-14		0743	3 43	79	N	121 39	40	E	AFADs steel drum	colour: Red / white
202	18-Nov-14		0750	3 46	03	N	121 42	56	E	AFADs steel drum	colour: Red / white
203	18-Nov-14		0800	3 43	49	N	121 43	22	E	AFADs steel drum	colour: Red / white (NHO 99)
204	18-Nov-14		0812	3 44	04	N	121 46	09	E	AFADs steel drum	colour: Red / white
205	18-Nov-14		0818	3 39	83	N	121 45	35	E	AFADs steel drum	colour: Red / white
206	18-Nov-14		0830	3 41	36	N	121 47	46	E	AFADs steel drum	colour: Red / white
207	18-Nov-14		0835	3 38	16	N	121 49	65	E	AFADs steel drum	Purse seine fishing boat
208	18-Nov-14		0900	3 39	64	N	121 52	30	E	AFADs steel drum	colour: Red / white
209	18-Nov-14		0923	3 35	12	N	121 55	81	E	AFADs steel drum	colour: Red / white
210	18-Nov-14		0930	3 38	94	N	121 55	56	E	AFADs steel drum	colour: Red / white
211	18-Nov-14		0940	3 35	54	N	121 58	88	E	AFADs steel drum	colour: Red / white
212	18-Nov-14		0942	3 38	35	N	121 59	17	E	AFADs steel drum	colour: Red / white / fishing boat
213	18-Nov-14		1005	3 34	81	N	121 01	45	E	AFADs steel drum	colour: Red / white
214	18-Nov-14		1010	3 26	88	N	122 02	41	E	AFADs steel drum	colour: Red / white
215	18-Nov-14		1011	3 31	70	N	122 04	55	E	AFADs steel drum	colour: Red / white
216	18-Nov-14		1020	3 28	44	N	122 05	41	E	AFADs steel drum	colour: Red / white
217	18-Nov-14		1031	3 31	68	N	122 07	25	E	AFADs steel drum	colour: Red / white
218	18-Nov-14		1035	3 28	47	N	122 05	27	E	AFADs steel drum	colour: Red / white
219	18-Nov-14		1047	3 27	81	N	122 08	27	E	AFADs steel drum	colour: Red / white
220	18-Nov-14		1049	3 32	09	N	122 10	46	E	AFADs steel drum	colour: Red / white
221	18-Nov-14		1100	3 29	73	N	122 11	21	E	AFADs steel drum	colour: Red / white
222	18-Nov-14		1105	3 28	00	N	122 13	37	E	AFADs steel drum	colour: Red / white / fishing boat
223	18-Nov-14		1108	3 26	49	N	122 10	77	E	AFADs steel drum	colour: Red / white
224	18-Nov-14		1113	3 25	68	N	122 12	60	E	AFADs steel drum	colour: Red / white
225	18-Nov-14		1116	3 31	69	N	122 13	35	E	AFADs steel drum	colour: Red / white
226	18-Nov-14		1120	3 26	24	N	122 15	17	E	AFADs steel drum	colour: Red / white
227	18-Nov-14		1140	3 27	98	N	122 18	50	E	AFADs steel drum	colour: Red / white / fishing boat
228	18-Nov-14		1147	3 22	65	N	122 16	54	E	AFADs steel drum	colour: Red / white
229	18-Nov-14		1647	2 59	16	N	123 00	91	E	AFADs steel drum	floating hut
230	19-Nov-14		0700	1 41	05	N	125 14	55	E	AFADs/ stylefoam	colour: Yellow / fishing boat
231	19-Nov-14		0747	1 32	85	N	125 18	45	E	AFADs/ stylefoam	colour: Yellow

Leg 3

232	22-Nov-14	B- 45	1621	2 27	17	N	125 01	06	E	AFADs steel drum	colour: white
233	22-Nov-14	B- 45	1621	2 28	70	N	124 56	94	E	AFADs steel drum	floating hut
234	22-Nov-14	B- 45	1622	2 31	65	N	124 59	66	E	AFADs steel drum	floating hut
235	24-Nov-14	50-51	0621	2 28	45	N	123 19	54	E	AFADs steel drum	floating hut
236	24-Nov-14	50-51	0621	2 27	81	N	123 20	17	E	AFADs steel drum	floating hut
237	24-Nov-14	50-51	0622	2 31	64	N	123 19	35	E	AFADs steel drum	floating hut
238	24-Nov-14	50-51	0820	2 28	62	N	123 01	63	E	AFADs steel drum	floating hut
239*	24-Nov-14	50-51	0820	2 30	23	N	122 59	76	E	AFADs steel drum	floating hut *EK-60/fish sampling
240	24-Nov-14	51-52	1257	2 30	87	N	122 51	61	E	AFADs steel drum	colour: Blue
241	24-Nov-14	51-52	1310	2 30	51	N	122 49	54	E	AFADs /Bamboo	
242	24-Nov-14	51-52	1315	2 29	46	N	122 48	47	E	AFADs steel drum	colour: white

No.	Date	Station	Time	Location							Type of FADs	Remark	
				Lat			Long						
243	24-Nov-14	51-52	1335	2	28	77	N	122	44	53	E	AFADs steel drum	colour: white
244	24-Nov-14	51-52	1338	2	27	99	N	122	42	64	E	AFADs steel drum	colour: Red / white
245	24-Nov-14	51-52	1350	2	32	73	N	122	41	38	E	AFADs steel drum	colour: blue/white / fishing boat
246	24-Nov-14	51-52	1420	2	28	22	N	122	37	39	E	AFADs steel drum	colour: blue
247	24-Nov-14	51-52	1735	2	30	05	N	122	06	36	E	AFADs steel drum	colour: blue
248	26-Nov-14	56-57	0705	1	28	80	N	119	57	89	E	AFADs steel drum	colour: blue
249	26-Nov-14	56-57	0715	1	31	87	N	120	00	67	E	AFADs steel drum	colour: blue
250	26-Nov-14	56-57	0802	1	27	43	N	120	07	08	E	AFADs steel drum	floating hut
251	26-Nov-14	56-57	0810	1	29	95	N	120	10	68	E	AFADs steel drum	fishing boat
252	26-Nov-14	57-58	1155	1	31	06	N	120	33	76	E	AFADs /stylefoam	colour: white / fishing boat
253*	26-Nov-14	57-58	1205	1	31	43	N	120	34	74	E	AFADs /stylefoam	colour: yellow / fishing boat*
													EK-60 / fish sampling
254	26-Nov-14	57-58	1518	1	28	02	N	120	42	17	E	AFADs /Bamboo	
255	26-Nov-14	57-58	1525	1	31	81	N	120	43	24	E	AFADs /Bamboo	
256	26-Nov-14	57-58	1535	1	30	30	N	120	45	75	E	AFADs /Bamboo	with stylefoam
257	26-Nov-14	57-58	1555	1	32	23	N	120	50	13	E	AFADs /Bamboo	with stylefoam
258	27-Nov-14	59-60	0545	1	29	68	N	122	41	98	E	AFADs steel drum	colour: blue/white
259	27-Nov-14	59-60	0630	1	29	31	N	122	50	17	E	AFADs steel drum	colour: red
260	27-Nov-14	59-60	0633	1	31	03	N	122	52	63	E	AFADs steel drum	Ring net fishing boat
261	27-Nov-14	59-60	0710	1	30	16	N	122	57	19	E	AFADs steel drum	colour: Red
262	27-Nov-14	59-60	0743	1	28	42	N	123	02	47	E	AFADs steel drum	
263	27-Nov-14	59-60	0753	1	27	28	N	123	04	67	E	AFADs steel drum	
264	27-Nov-14	59-60	0830	1	27	45	N	123	11	81	E	AFADs steel drum	
265	27-Nov-14	59-60	0835	1	31	77	N	123	10	92	E	AFADs steel drum	
266	27-Nov-14	59-60	0840	1	30	96	N	123	12	26	E	AFADs steel drum	
267	27-Nov-14	59-60	0840	1	30	54	N	123	13	94	E	AFADs steel drum	
268	27-Nov-14	59-60	0900	1	27	82	N	123	14	96	E	AFADs steel drum	
269	27-Nov-14	59-60	0931	1	31	32	N	123	30	64	E	AFADs steel drum	
270	27-Nov-14	59-60	0931	1	28	00	N	123	22	36	E	AFADs steel drum	
271	27-Nov-14	59-60	1010	1	30	36	N	123	29	68	E	AFADs steel drum	colour: Yellow
272	27-Nov-14	59-60	1010	1	31	22	N	123	29	37	E	AFADs steel drum	colour: Blue/white
273	27-Nov-14	59-60	1015	1	29	07	N	123	29	49	E	AFADs steel drum	colour: Yellow
274	27-Nov-14	59-60	1343	1	30	31	N	123	29	70	E	AFADs steel drum	colour: Orenge
275	27-Nov-14	59-60	1343	1	31	17	N	123	29	29	E	AFADs steel drum	colour: Orenge
276	27-Nov-14	60-61	1415	1	29	94	N	123	35	39	E	AFADs steel drum	colour: Red/white
277	27-Nov-14	60-61	1433	1	31	85	N	123	40	14	E	AFADs steel drum	colour: Red
278	27-Nov-14	60-61	1445	1	29	43	N	123	42	75	E	AFADs steel drum	with small house
279	27-Nov-14	60-61	1506	1	29	56	N	123	47	73	E	AFADs steel drum	colour: white / small house
280	27-Nov-14	60-61	1638	1	30	54	N	124	03	01	E	AFADs steel drum	
281	27-Nov-14	60-61	1638	1	31	52	N	124	01	73	E	AFADs steel drum	colour: Red
282	27-Nov-14	60-61	1645	1	27	14	N	124	02	97	E	AFADs steel drum	
283	27-Nov-14	60-61	1652	1	31	18	N	124	05	95	E	AFADs steel drum	
284	27-Nov-14	60-61	1656	1	29	60	N	124	07	51	E	AFADs steel drum	
285	27-Nov-14	60-61	1700	1	31	5	N	124	05	44	E	AFADs steel drum	
286	27-Nov-14	60-61	1715	1	27	67	N	124	10	74	E	AFADs steel drum	
287	27-Nov-14	60-61	1716	1	28	74	N	124	10	92	E	AFADs steel drum	

Appendix 3 FADs/Payaos inventory in Sulu and Sulawesi Seas the second cruise survey in 28 April to 5 May 2015

No.	Date	Station	Time	Location			Type of FADs	Remark
				Lat	Long			
1	28-Mar-15	to St.1	1130	9 49.67	N 118	1.29	E AFADs steel drum	colour: orange
2	29-Mar-15	3	0927	10 14.96	N 121	30.22	E AFADs/Stylefoam	
3	30-Mar-15	I1- 6	0620	8 51.84	N 122	25.44	E AFADs steel drum	
4	30-Mar-15	I1- 6	0750	8 56.72	N 122	11.88	E AFADs /bamboo	
5	30-Mar-15	I1- 6	0930	9 3.52	N 121	56.19	E AFADs steel drum	
6	31-Mar-15	9-10	1105	9 9.01	N 118	50.06	E AFADs steel drum	3 fishing boat
7	31-Mar-15	9-10	1320	8 48.50	N 118	35.98	E AFADs steel drum	1 fishing boat
8	31-Mar-15	9-10	1340	8 42.34	N 118	31.26	E AFADs steel drum	3 fishing boat
9	31-Mar-15	9-10	1347	8 43.50	N 118	37.22	E AFADs steel drum	colour: white
10	31-Mar-15	10	1625	8 39.63	N 118	28.10	E AFADs steel drum	colour: white
11	31-Mar-15	10-11	1700	8 40.99	N 118	35.48	E AFADs/Stylefoam	
12*	4-Apr-15	21	1247	6 19.14	N 119	30.11	E AFADs steel drum	5 fishing boat / collected sample
13	4-Apr-15	21-22	1425	6 27.59	N 119	39.89	E AFADs steel drum	colour: white
14	4-Apr-15	21-22	1445	6 31.457	N 119	42.08	E AFADs steel drum	colour: Red
15	4-Apr-15	21-22	1500	6 30.00	N 119	45.43	E AFADs steel drum	colour: white
16	4-Apr-15	21-22	1630	6 37.19	N 119	59.44	E AFADs steel drum	colour: white
17	4-Apr-15	21-22	1645	6 42.50	N 120	2.72	E AFADs steel drum	colour: white
18	4-Apr-15	22	1710	6 45.49	N 120	5.62	E AFADs steel drum	colour: white
Leg 2								
19	8-Apr-15	to St.24	0915	6 49.35	N 122	18.82	E AFADs /bamboo	
20	8-Apr-15	24	1050	6 50.06	N 121	28.24	E AFADs /bamboo	
21	8-Apr-15	24	1053	6 50.04	N 121	29.13	E AFADs /bamboo	
22	8-Apr-15	24	1056	6 50.04	N 122	29.59	E AFADs /bamboo	
23	8-Apr-15	24	1058	6 50.04	N 122	29.93	E AFADs /bamboo	
24	8-Apr-15	24-25	1257	6 52.95	N 122	31.48	E AFADs /bamboo	
25	8-Apr-15	24-25	1317	6 52.02	N 122	34.93	E AFADs /bamboo	
26	8-Apr-15	24-25	1329	6 50.01	N 122	34.689	E AFADs /bamboo	
27	8-Apr-15	24-25	1341	6 49.55	N 122	37.73	E AFADs steel drum	
28	8-Apr-15	24-25	1345	6 52.04	N 122	37.14	E AFADs steel drum	
29	8-Apr-15	24-25	1430	6 46.00	N 122	43.0	E AFADs steel drum	
30	8-Apr-15	24-25	1440	6 46.00	N 122	45.0	E AFADs steel drum	
31	8-Apr-15	24-25	1450	6 51.00	N 122	58.0	E AFADs steel drum	colour: white
32	9-Apr-15	27-28	0550	6 15.34	N 123	45.51	E AFADs steel drum	colour: white
33	9-Apr-15	27-28	0755	6 14.99	N 123	22.68	E AFADs steel drum	
34	9-Apr-15	27-28	0806	6 14.99	N 123	21.40	E AFADs steel drum	with fishing boat
35	9-Apr-15	27-28	0904	6 14.93	N 123	11.25	E AFADs steel drum	with fishing boat
36	9-Apr-15	27-28	0905	6 14.93	N 123	11.14	E AFADs steel drum	with fishing boat
37*	9-Apr-15	27-28	0946	6 15.14	N 123	1.89	E AFADs steel drum	with fishing boat/ collected sample
38	9-Apr-15	28-30	1355	6 1.40	N 122	58.94	E AFADs steel drum	with fishing boat /colour: orange
39	9-Apr-15	28-30	1358	6 0.45	N 122	58.95	E AFADs steel drum	with fishing boat /colour: orange
40	9-Apr-15	28-30	1730	5 42.32	N 122	59.76	E AFADs steel drum	colour: white
41	10-Apr-15	31-32	1059	5 45.72	N 124	7.75	E AFADs steel drum	colour: white
42	10-Apr-15	31-32	1120	5 42.73	N 124	9.54	E AFADs steel drum	with fishing boat /colour:white
43	10-Apr-15	31-32	1138	5 42.20	N 124	15.38	E AFADs steel drum	with fishing boat /colour:white
44	10-Apr-15	31-32	1147	5 43.18	N 124	14.92	E AFADs steel drum	with PSfishing boat /colour:orange
45	10-Apr-15	31-32	1209	5 38.75	N 124	19.23	E AFADs steel drum	with PSfishing boat /colour:orange
46	10-Apr-15	31-32	1211	5 37.96	N 124	20.05	E AFADs steel drum	with PSfishing boat /colour:orange
47	10-Apr-15	31-32	1218	5 38.57	N 124	20.21	E AFADs steel drum	with 3 fishing boat /colour:orange
48	10-Apr-15	31-32	1219	5 39.34	N 124	21.89	E AFADs steel drum	with 1 fishing boat /colour:orange
49	10-Apr-15	31-32	1226	5 41.62	N 124	24.10	E AFADs steel drum	with 2 fishing boat /colour:orange

No.	Date	Station	Time	Location			Type of FADs	Remark
				Lat	Long			
50	10-Apr-15	31-32	1247	5 39.08	N 124 24.83	E	AFADs steel drum	colour: white
51	10-Apr-15	31-32	1259	5 38.37	N 124 28.09	E	AFADs steel drum	colour: white
52	10-Apr-15	31-32	1300	5 37.56	N 124 27.47	E	AFADs steel drum	colour: white
53	10-Apr-15	31-32	1302	5 39.54	N 124 29.66	E	AFADs steel drum	colour: white
54	10-Apr-15	31-32	1314	5 35.36	N 124 29.96	E	AFADs steel drum	with 4 fishing boat /colour:white
55	10-Apr-15	31-32	1318	5 35.70	N 124 30.64	E	AFADs steel drum	with 2 fishing boat /colour:white
56	10-Apr-15	31-32	1320	5 38.47	N 124 31.00	E	AFADs steel drum	with 2 fishing boat /colour:white
57	10-Apr-15	31-32	1321	5 38.81	N 124 33.13	E	AFADs steel drum	colour:white
58	10-Apr-15	31-32	1343	5 36.15	N 124 35.58	E	AFADs steel drum	with 2 fishing boat /colour:white
59	10-Apr-15	31-32	1602	5 40.35	N 124 33.04	E	AFADs steel drum	with 2 fishing boat /colour:white
60	10-Apr-15	31-32	1604	5 41.71	N 124 34.86	E	AFADs steel drum	with 1 fishing boat /colour:white
61*	10-Apr-15	31-32	1608	5 40.57	N 124 33.93	E	AFADs/Stylefoam	with PS fishing boat /collect SP.
62	10-Apr-15	31-32	1642	5 38.70	N 124 33.29	E	AFADs steel drum	with 1 fishing boat /colour:white
63	10-Apr-15	31-32	1655	5 37.28	N 124 36.82	E	AFADs steel drum	with 1 fishing boat /colour:white
64	10-Apr-15	31-32	1657	5 36.84	N 124 35.95	E	AFADs steel drum	Rusty /colour:orange
65	10-Apr-15	31-32	1710	5 35.21	N 124 33.59	E	AFADs steel drum	Rusty /colour:orange
66	10-Apr-15	31-32	1714	5 33.87	N 124 32.57	E	AFADs steel drum	Rusty /colour:orange
67	10-Apr-15	31-32	1722	5 32.73	N 124 31.24	E	AFADs steel drum	with 3 fishing boat /colour:orange
68	10-Apr-15	31-32	1730	5 33.38	N 124 29.58	E	AFADs steel drum	with 3 fishing boat /colour:orange
69	10-Apr-15	31-32	1734	5 31.50	N 124 29.64	E	AFADs steel drum	with 5 fishing boat /colour:orange
70	11-Apr-15	34-35	0855	4 59.90	N 122 49.93	E	AFADs steel drum	colour:orange
71	11-Apr-15	34-35	0958	5 2.91	N 122 38.26	E	AFADs steel drum	colour: white
72	11-Apr-15	34-35	1100	5 0.44	N 122 26.95	E	AFADs steel drum	colour:orange
73	11-Apr-15	34-35	1118	4 58.79	N 122 24.13	E	AFADs steel drum	colour:orange
74	11-Apr-15	34-35	1124	5 00.05	N 122 23.51	E	AFADs steel drum	Rusty /colour:white
75	11-Apr-15	34-35	1154	5 01.66	N 122 17.40	E	AFADs steel drum	colour:orange
76	11-Apr-15	34-35	1157	4 58.26	N 122 17.58	E	AFADs steel drum	colour:orange
77	11-Apr-15	34-35	1236	5 01.78	N 122 8.45	E	AFADs steel drum	Rusty /colour:white
78	11-Apr-15	34-35	1300	5 00.00	N 122 6.57	E	AFADs steel drum	colour:orange
79	11-Apr-15	35-39	1549	5 05.46	N 122 00.29	E	AFADs steel drum	colour:orange
80	11-Apr-15	35-39	1616	5 08.48	N 122 00.41	E	AFADs steel drum	with 1 fishing boat /colour: orange
81	11-Apr-15	35-39	1622	5 10.59	N 121 59.05	E	AFADs steel drum	2 FADs
82	11-Apr-15	35-39	1718	5 19.34	N 122 2.26	E	AFADs steel drum	colour: white
83	11-Apr-15	35-39	1749	5 28.66	N 122 1.48	E	AFADs steel drum	colour: white
84	12-Apr-15	36-37	0632	5 14.22	N 121 18.06	E	AFADs /bamboo	
85	12-Apr-15	36-37	0730	5 8.97	N 121 10.29	E	AFADs steel drum	colour: white
86	12-Apr-15	36-37	0825	5 4.13	N 121 5.06	E	AFADs steel drum	colour: white
87	12-Apr-15	37-38	1129	4 57.40	N 121 4.015	E	AFADs steel drum	colour: white
88	12-Apr-15	37-38	1136	4 58.34	N 121 5.69	E	AFADs steel drum	colour: white
89	12-Apr-15	37-38	1137	4 56.70	N 121 7.12	E	AFADs steel drum	with 2 fishing boat /colour:white
90	12-Apr-15	37-38	1207	4 53.85	N 121 10.87	E	AFADs steel drum	colour: white
91	12-Apr-15	37-38	1224	4 54.51	N 121 17.88	E	AFADs steel drum	colour: white
92	12-Apr-15	37-38	1228	4 50.91	N 121 15.06	E	AFADs steel drum	colour: white
93	12-Apr-15	37-38	1234	4 54.49	N 121 17.91	E	AFADs steel drum	with 1 fishing boat /colour:white
94	12-Apr-15	37-38	1235	4 51.82	N 121 15.05	E	AFADs steel drum	colour: white
95	12-Apr-15	37-38	1239	4 52.46	N 121 18.76	E	AFADs steel drum	colour: white
96	12-Apr-15	37-38	1240	4 49.68	N 121 18.29	E	AFADs steel drum	colour: white
97	12-Apr-15	37-38	1243	4 49.53	N 121 18.79	E	AFADs steel drum	with 3 fishing boat /colour:white
98	12-Apr-15	37-38	1245	4 52.66	N 121 20.05	E	AFADs steel drum	with 2 fishing boat /colour:white
99	12-Apr-15	37-38	1251	4 50.102	N 121 20.31	E	AFADs steel drum	with 1 fishing boat /colour:white

No.	Date	Station	Time	Location				Type of FADs	Remark	
				Lat		Long				
100	12-Apr-15	37-38	1301	4	50.22	N	121	22.87	E AFADs steel drum	with 1 fishing boat /colour:white
101	12-Apr-15	37-38	1304	4	48.60	N	121	21.37	E AFADs steel drum	2 FADs with 1 fishing boat /:white
102	12-Apr-15	37-38	1315	4	51.85	N	121	23.11	E AFADs steel drum	with 1 fishing boat /colour:white
103	12-Apr-15	37-38	1324	4	50.46	N	121	26.05	E AFADs steel drum	with 1 fishing boat /colour:white
104	12-Apr-15	37-38	1328	4	46.82	N	121	24.78	E AFADs steel drum	with 1 fishing boat /colour:white
105	12-Apr-15	37-38	1334	4	47.66	N	121	26.55	E AFADs steel drum	with 1 fishing boat /colour:white
106	12-Apr-15	37-38	1406	4	47.82	N	121	32.68	E AFADs steel drum	with 1 fishing boat /colour:white
107	12-Apr-15	37-38	1420	4	44.83	N	121	34.14	E AFADs steel drum	with 1+6 fishing boat /colour:white
108	12-Apr-15	37-38	1443	4	42.46	N	121	36.03	E AFADs steel drum	colour: white / black
109	12-Apr-15	37-38	1500	4	42.15	N	121	40.21	E AFADs steel drum	with 1 fishing boat /colour: orange
110*	12-Apr-15	37-38	1508	4	40.88	N	121	40.15	E AFADs steel drum	1+6 fishing boat/orange*/collected SP
111	12-Apr-15	37-38	1547	4	42.64	N	121	44.91	E AFADs steel drum	with 1 fishing boat /:white/green
112	12-Apr-15	37-38	1551	4	36.49	N	121	43.35	E AFADs steel drum	with 1 fishing boat /:white/green
113	12-Apr-15	37-38	1601	4	38.34	N	121	46.02	E AFADs steel drum	:white/green
114	12-Apr-15	37-38	1615	4	35.16	N	121	47.57	E AFADs steel drum	with 1 fishing boat /:white/green
115	12-Apr-15	37-38	1634	4	36.66	N	121	52.57	E AFADs steel drum	:white/green
116	12-Apr-15	37-38	1653	4	32.36	N	121	59.81	E AFADs steel drum	PS fishing boat /colour: orange
117	12-Apr-15	37-38	1701	4	34.63	N	121	55.63	E AFADs steel drum	:white/blue
118	12-Apr-15	37-38	1703	4	32.25	N	121	54.43	E AFADs steel drum	:white/blue
119	12-Apr-15	37-38	1705	4	31.69	N	121	52.69	E AFADs steel drum	:white/blue
120	13-Apr-15	37	1205	3	57.34	N	122	56.04	E AFADs steel drum	:white/orange
121	13-Apr-15	38-39	1404	3	59.99	N	122	2.89	E AFADs steel drum	:white/green
122	13-Apr-15	38-39	1619	3	59.24	N	122	34.14	E AFADs steel drum	:white/green
123	13-Apr-15	38-39	1648	3	55.96	N	122	27.00	E AFADs steel drum	:white/green
124	13-Apr-15	38-39	1704	3	00.06	N	122	28.52	E AFADs steel drum	with 5 fishing boat /:white/green
125	13-Apr-15	38-39	1705	3	00.04	N	122	28.28	E AFADs steel drum	with 6 fishing boat /:white/green
126	13-Apr-15	38-39	1736	3	00.72	N	122	22.35	E AFADs steel drum	colour: white
127	13-Apr-15	38-39	1737	3	00.90	N	122	21.34	E AFADs steel drum	colour: white
128	13-Apr-15	38-39	1750	3	00.82	N	122	20.17	E AFADs steel drum	Green
129	14-Apr-15	40-41	0630	3	00.10	N	120	36.93	E AFADs steel drum	Orange
130	14-Apr-15	41-42	0705	3	59.37	N	120	29.47	E AFADs steel drum	colour: white
131	14-Apr-15	41-42	0706	3	59.38	N	120	29.47	E AFADs steel drum	colour: white
132	14-Apr-15	41-42	0900	3	56.32	N	120	26.90	E AFADs steel drum	colour: white
133	14-Apr-15	41-42	1035	3	55.57	N	120	23.60	E AFADs steel drum	colour: white
134	14-Apr-15	41-42	1043	4	00.05	N	120	20.24	E AFADs steel drum	colour: white
135	14-Apr-15	41-42	1044	4	00.06	N	120	20.93	E AFADs steel drum	colour: Red / Yellow
136	14-Apr-15	41-42	1053	4	03.61	N	120	16.81	E AFADs steel drum	with 1+5fishing boat /:red/yellow
137	14-Apr-15	41-42	1100	3	88.30	N	120	16.53	E AFADs steel drum	colour: Red / Yellow
138	14-Apr-15	41-42	1110	3	58.83	N	120	15.45	E AFADs steel drum	with 1+5fishing boat /:red/yellow
139	14-Apr-15	41-42	1121	3	58.42	N	120	12.96	E AFADs steel drum	:white/blue
140	14-Apr-15	41-42	1124	4	00.66	N	120	12.11	E AFADs steel drum	:white/blue
141	14-Apr-15	41-42	1126	3	59.07	N	120	11.63	E AFADs steel drum	:white/blue
142	14-Apr-15	41-42	1135	3	58.77	N	120	09.68	E AFADs steel drum	:white/blue
143	14-Apr-15	41-42	1152	3	58.27	N	120	6.18	E AFADs steel drum	:white/blue / 1 fishing boat
144	14-Apr-15	41-42	1207	3	59.94	N	120	5.04	E AFADs steel drum	:white/orange
145	14-Apr-15	41-42	1217	3	57.33	N	120	3.02	E AFADs steel drum	with 1 fishing boat /:white/oragne
146	14-Apr-15	41-42	1219	3	59.14	N	120	1.85	E AFADs steel drum	:white/orange
147	14-Apr-15	41-42	1222	4	00.67	N	120	00.93	E AFADs steel drum	:white/orange
148	14-Apr-15	41-42	1237	3	58.79	N	119	57.94	E AFADs steel drum	:white/blue
149	14-Apr-15	41-42	1237	3	58.77	N	119	57.94	E AFADs steel drum	:white/orange

No.	Date	Station	Time	Location				Type of FADs	Remark	
				Lat		Long				
150	14-Apr-15	41-42	1253	4	2.66	N	119	53.88	E AFADs steel drum	:white/blue
151	14-Apr-15	41-42	1254	3	59.33	N	119	54.23	E AFADs steel drum	:white/blue
152	14-Apr-15	41-42	1311	3	59.16	N	119	50.64	E AFADs steel drum	:white/blue
153	14-Apr-15	41-42	1400	3	59.95	N	119	41.55	E AFADs steel drum	with 1 fishing boat /colour:orange
154	14-Apr-15	41-42	1403	4	1.91	N	119	40.24	E AFADs steel drum	with 1 fishing boat /colour:orange
155	14-Apr-15	41-42	1405	4	1.29	N	119	39.54	E AFADs steel drum	with 1+4 fishing boat /colour:orange
156	22-Apr-15	SK-BT	0528	2	19.43	N	124	18.68	E AFADs /bamboo	with hut
157	22-Apr-15	SK-BT	0543	2	11.11	N	124	23.81	E AFADs steel drum	with hut
158	22-Apr-15	SK-BT	0545	2	21.27	N	124	23.44	E AFADs steel drum	with hut
159	22-Apr-15	SK-BT	0610	2	17.37	N	124	30.61	E AFADs /bamboo	
160	22-Apr-15	SK-BT	0618	2	12.24	N	124	29.19	E AFADs /bamboo	
161	22-Apr-15	SK-BT	0618	2	11.44	N	124	30.77	E AFADs /bamboo	
162	22-Apr-15	SK-BT	0622	2	14.92	N	124	32.87	E AFADs steel drum	with hut
163	22-Apr-15	SK-BT	0715	2	10.08	N	124	38.22	E AFADs steel drum	with hut
164	22-Apr-15	SK-BT	0716	2	9.17	N	124	38.77	E AFADs steel drum	with hut
165	22-Apr-15	SK-BT	0728	2	9.66	N	124	37.91	E AFADs steel drum	with hut
166	22-Apr-15	SK-BT	0734	2	12.15	N	124	42.05	E AFADs steel drum	with hut
167	22-Apr-15	SK-BT	0747	2	5.18	N	124	40.53	E AFADs steel drum	with hut
168	22-Apr-15	SK-BT	0748	2	7.89	N	124	42.65	E AFADs steel drum	with hut
169	22-Apr-15	SK-BT	0753	2	7.07	N	124	41.23	E AFADs steel drum	colour:yellow
170	22-Apr-15	SK-BT	0758	2	6.51	N	124	42.79	E AFADs steel drum	
171	22-Apr-15	SK-BT	0806	2	5.95	N	124	45.45	E AFADs steel drum	with hut
172	22-Apr-15	SK-BT	1437	1	45.64	N	125	8.53	E AFADs /bamboo	
173	22-Apr-15	SK-BT	1440	1	45.73	N	125	9.62	E AFADs /bamboo	
Leg 3										
174	25-Apr-15	BT-45	1500	2	24.98	N	125	0.10	E AFADs steel drum	with hut
175	25-Apr-15	BT-45	1505	2	25.05	N	125	2.77	E AFADs steel drum	
176	25-Apr-15	BT-45	1508	2	24.70	N	124	59.10	E AFADs steel drum	with hut
177	25-Apr-15	BT-45	1514	2	25.09	N	124	56.96	E AFADs steel drum	with hut
178	25-Apr-15	BT-45	1520	2	29.94	N	124	59.35	E AFADs steel drum	with hut
179	25-Apr-15	BT-45	1521	2	29.88	N	124	56.98	E AFADs steel drum	with hut
180	25-Apr-15	BT-45	1540	2	34.81	N	124	58.47	E AFADs steel drum	with hut
181	25-Apr-15	BT-45	1540	2	24.55	N	124	59.38	E AFADs /bamboo	with hut
182	25-Apr-15	BT-45	1543	2	24.70	N	125	0.51	E AFADs /bamboo	with hut
183	25-Apr-15	BT-45	1545	2	24.91	N	124	57.18	E AFADs /bamboo	with hut
184	25-Apr-15	45-46	1753	2	34.77	N	124	59.22	E AFADs /bamboo	with hut
185	26-Apr-15	50	1117	2	33.43	N	124	0.63	E AFADs /bamboo	with hut
186	26-Apr-15	50	1117	2	33.67	N	124	1.97	E AFADs /bamboo	with hut
187	26-Apr-15	50	1117	2	36.49	N	123	55.85	E AFADs /bamboo	with hut
188	26-Apr-15	50	1117	2	34.71	N	123	59.120	E AFADs /bamboo	with hut
189	26-Apr-15	50	1117	2	30.67	N	123	59.23	E AFADs /bamboo	with hut
190	27-Apr-15	50-51	1154	2	30.09	N	123	58.67	E AFADs steel drum	with hut
191	27-Apr-15	50-51	1220	2	30.00	N	123	57.12	E AFADs steel drum	
192	27-Apr-15	50-51	1303	2	30.56	N	123	47.30	E AFADs steel drum	with fishinh boat
193	27-Apr-15	50-51	1305	2	30.91	N	123	44.91	E AFADs steel drum	with fishinh boat
194	27-Apr-15	50-51	1335	2	29.75	N	123	44.14	E AFADs steel drum	
195	27-Apr-15	50-51	1405	2	28.18	N	123	38.25	E AFADs steel drum	with hut
196	27-Apr-15	50-51	1419	2	24.44	N	123	36.29	E AFADs steel drum	with hut
197	27-Apr-15	50-51	1449	2	25.70	N	123	30.31	E AFADs steel drum	with hut
198	27-Apr-15	50-51	1450	2	28.74	N	123	30.44	E AFADs steel drum	

No.	Date	Station	Time	Location				Type of FADs	Remark	
				Lat		Long				
199	27-Apr-15	50-51	1453	2	31.71	N	123	29.31	E	AFADs steel drum with hut
200	27-Apr-15	50-51	1455	2	24.68	N	123	28.19	E	AFADs steel drum with hut and fishing boat
201	27-Apr-15	50-51	1517	2	28.42	N	123	25.94	E	AFADs steel drum with hut
202	27-Apr-15	50-51	1533	2	25.13	N	123	22.25	E	AFADs steel drum with hut
203	27-Apr-15	50-51	1548	2	29.53	N	123	21.48	E	AFADs steel drum
204	27-Apr-15	50-51	1426	2	31.92	N	123	13.70	E	AFADs steel drum with hut and fishing boat
205	27-Apr-15	50-51	1711	2	31.70	N	123	5.88	E	AFADs steel drum with hut
206	28-Apr-15		1306	2	33.59	N	120	40.43	E	AFADs steel drum
207*	30-Apr-15	58	0645	1	28.96	N	121	31.40	E	AFADs steel drum Hydro acoustic survey, colour:orange, I
208	30-Apr-15	58	0648	1	32.05	N	121	31.05	E	AFADs steel drum
209	30-Apr-15	58	1136	1	29.99	N	121	40.30	E	AFADs steel drum colour:white
210	30-Apr-15	58	1221	1	27.25	N	121	49.79	E	AFADs steel drum with hut
211	30-Apr-15	58-59	1452	1	27.32	N	122	21.81	E	AFADs steel drum with fishing boat
212	30-Apr-15	58-59	1454	1	29.04	N	122	21.87	E	AFADs steel drum colour:white
213	30-Apr-15	58-59	1504	1	29.55	N	122	23.77	E	AFADs steel drum Hydro acoustic survey, with fishing boa
214	1-May-15	60-61	0535	1	29.66	N	124	11.32	E	AFADs steel drum colour:white red
215	1-May-15	60-61	0615	1	30.27	N	124	18.68	E	AFADs steel drum colour:white brown
216	1-May-15	60-61	0618	1	30.37	N	124	19.61	E	AFADs steel drum colour:white brown
217	1-May-15	60-61	0624	1	28.98	N	124	21.27	E	AFADs steel drum colour:white
218	1-May-15	60-61	0627	1	30.83	N	124	22.58	E	AFADs steel drum
219	1-May-15	60-61	0631	1	28.31	N	124	22.09	E	AFADs styrofoam
220	1-May-15	60-61	0633	1	31.89	N	124	23.26	E	AFADs steel drum
221	1-May-15	60-61	0635	1	30.33	N	124	23.33	E	AFADs steel drum
222	1-May-15	60-61	0645	1	30.28	N	124	26.46	E	AFADs steel drum
223	1-May-15	60-61	0650	1	28.23	N	124	24.90	E	AFADs styrofoam

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Joint Research Program on Tuna Resources
in Sulu and Sulawesi Seas